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The economic impact of the woodworking industry in Newfoundland, 1981

G.R. Milne and K.G. Mallay

Information Report N-X-220

Newfoundland Forest Research Centre

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THE ECONOMIC IMPACT OF THE WOODWORKING INDUSTRY IN NEWFOUNDLAND, 1981

by G.R. Milne and K.G. Mallay

INFORMATION REPORT N-X-220
1984

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ABSTRACT

The Newfoundland woodworking industry was surveyed during 1982 to collect data from the 1981 calendar year. This report presents statistics on plant operation, input, output and contributions to the provincial economy. The industry manufactured a wide range of products, worth $33.8 million, from 28 747 m3 of wood fibre. Direct employment of 521 person years generated more than $9.4 million in direct income. Total company expenditures, excluding wood, were $7.6 million in 1981. Indirect economic benefits include 276 person years of employment, and $3.8 million in income. The woodworking industry is also compared to other sectors of the Newfoundland economy, and is found to rank high in terms of average value added, and income per employee. Problems occurring in the industry are discussed, in view of potential for future development.

RÈSUMÈ

L'industrie de la menuiserie de Terre-Neuve a fait l'objet en 1982 d'un relevé visant à obtenir des données sur l'année civile 1981. Le présent rapport comprend des statistiques sur l'exploitation, les intrants et les extrants des usines ainsi que sur l'apport de ces dernières à l'économie de Terre-Neuve. L'industrie de la menuiserie a fabriqué un vaste éventail de produits d'une valeur de 33,8 millions de dollars à partir de 28 747 m^3 de fibres de bois. Les 521 années-personnes d'emploi qu'elle a créé directement ont comporté plus de 9,4 millions de dollars en revenus directs. Le total des dépenses des sociétés, à l'exclusion du prix du bois, a été de 7,6 millions de dollars en 1981. Les avantages économiques indirects de l'industrie ont compris 276 années-personnes d'emploi et 3,8 millions de dollars de revenus. À sa comparaison à d'autres secteurs de l'économie de Terre-Neuve, on constate que l'industrie de la menuiserie se classe parmi les premières pour ce qui est de la valeur ajoutée moyenne et des revenus par employé. On traite des problèmes de l'industrie dans le contexte de son potentiel d'expansion.

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THE ECONOMIC IMPACT OF THE WOODWORKING INDUSTRY IN NEWFOUNDLAND, 1981

by

G.R. Milne and K.G. Mallay

1.0 INTRODUCTION

The woodworking industry[1] in Newfoundland is relatively small compared with other regions of Canada. In 1981, the woodworking industry in Newfoundland had an estimated total value added of $20.7 million, or 1.3% of the Canadian total. In terms of output, Newfoundland woodworking plants had a total estimated value of shipments of $33.8 million, or 1.0% of the Canadian total. Despite its apparent small scale, on a national level, this industry is felt to play an important role in many Newfoundland communities and thus should be a significant contributor to the provincial economy as a whole.

In the past, there has been a lack of adequate information concerning the woodworking industry in Newfoundland. For example, Statistics Canada published data greatly underestimates the scope of the industry in Newfoundland. Statistics Canada only survey larger plants, omitting many smaller firms. As a result, the true industry structure, economic impacts, operating problems and growth potential cannot be accurately identified. More importantly, this lack of information hinders effective policy decisions directed at the woodworking industry.

In light of these problems, the Newfoundland Forest Research Centre's (NeFRC) Economics Section carried out a survey of the woodworking industry during 1982 to collect accurate production and economic data on this sector. Using these data, two publications were to be prepared. The first, a directory of all woodworking plants surveyed, has already been published (Mallay and Milne, 1983). The objective of the present report is to provide information on the economic impacts of the industry.

The report includes information on production, markets, employment, income, problems and opportunities. As well, the importance of the industry to rural Newfoundlanders, in terms of social and economic factors, is discussed. This report, in conjunction with the directory, will provide government officials with improved information for developing policies and identifying areas of the industry requiring assistance.

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[1] Defined as plants manufacturing finished produces from sawn lumber and plywood. For Newfoundland, these firms include veneer and plywood mills, sash, door and other millwork and other wood industries. A more detailed description is provided in Appendix A.

2.0 SURVEY METHODOLOGY

Recognizing that currently published information on the Newfoundland woodworking sector was inadequate, the initial step was to compile an accurate list of firms operating in 1981. In May of 1982, a search was initiated using business directories, telephone books and business advertising from across the Province. A total of 92 woodworking plants were identified, all on the Island portion of Newfoundland. While some extremely small and isolated plants may have been omitted, every effort was made to identify all woodworking plants throughout the Province. A questionnaire[1] was designed to assist in collecting the necessary data either through a personal interview session or mail survey.

Prior to conducting the Island-wide survey a trial survey of three plants in the St. John's vicinity was carried out with the cooperation of the Provincial Department of Development. These trial interviews tested the effectiveness of the questionnaire and the attitude of plant owners towards the survey. Based on these trials, the questionnaire was modified slightly.

To ensure a high response rate, the survey of the 92 plants was carried out using personal interviews. However in order to reduce travel costs, six of the more isolated plants were mailed a questionnaire. A non-response was to be followed up with one phone call.

The survey was initiated in June 1982 and continued throughout the summer. All field work was completed by the end of August 1982.

3.0 QUESTIONNAIRE RESPONSE

Of the 92 woodworking plants identified from 1981 information, a total of 66 participated in the 1982 survey. Of those firms which were surveyed, 63 were interviewed in person. Of the six firms mailed a questionnaire, three were returned with complete information. Follow-up phone calls to the three non-respondents failed to secure cooperation.

The quality of information on each questionnaire was good, which reflects the benefits of using mainly personal interviews for the survey. Any problems arising during data compilation were quickly resolved with a phone call to the plant owner.

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[1] A copy of the questionnaire is available from the authors upon request.

4.0 INDUSTRY STRUCTURE AND PLANT LOCATION

The Directory of Woodworking Industries (Mallay and Milne, 1983) classified the industry into seven major product groups as follows:

a) Cabinet manufacturers
b) Wooden door and window manufacturing
c) Casket makers
d) Toy manufacturers
e) Furniture manufacturing
f) Ship and boat builders
g) Roof trusses, mobile trailers, floor trusses

The 62 firms listed in the Directory[1] are summarized by region and product group (Table 1). Also, Figure 1 illustrates the location of communities with at least one firm among five survey regions.

Table 1. Plant location and product group, Newfoundland woodworking industry, 1981.

Survey Region	Number of Firms by Product Group							
	a	b	c	d	e	f	g	Total
1) St. John's and vicinity	9	8	-	2	3	-	2	24
2) Avalon peninsula (excluding region 1)	5	2	1	-	2	2	1	13
3) Bonavista and Burin peninsulas	3	2	-	-	-	4	-	9
4) Central Newfoundland	1	5	-	-	1	3	-	10
5) Western Newfoundland	3	-	-	1	-	2	-	6
Total	21	17	1	3	6	11	3	62

[1] Of the 66 firms participating in the survey, four did not wish to be listed in the Directory.

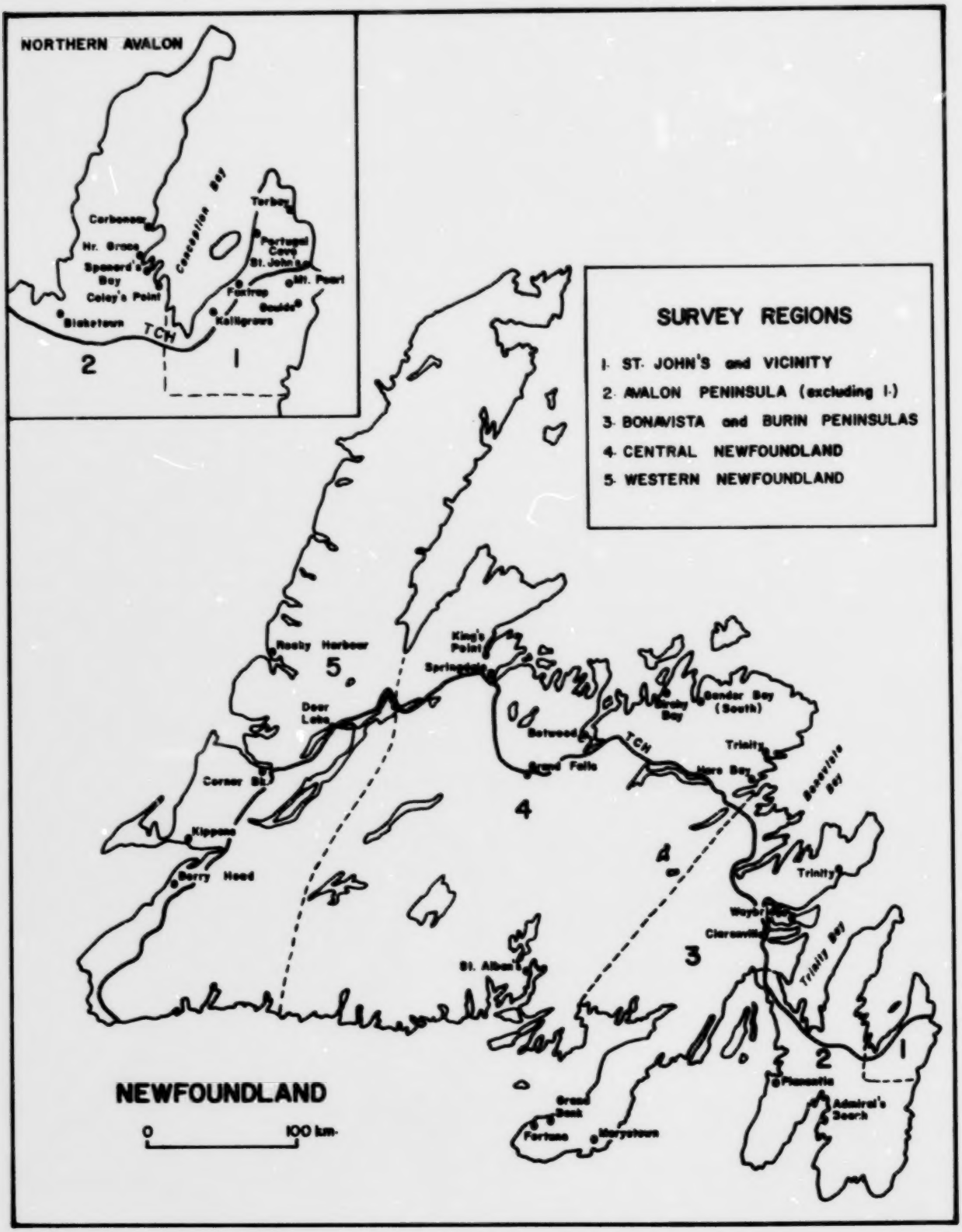

Figure 1. Location of woodworking plants in Newfoundland.

Overall, the majority of firms (38 firms or 61%) manufacture cabinets, wooden doors and windows as their primary products. The second largest product group is ship and boat building (18%), not surprising given the major importance of the fishing industry in Newfoundland.

Regionally, 37 firms (60%) are located on the Avalon Peninsula, mainly in the St. John's and Conception Bay areas. This concentration of firms reflects the fact that approximately one half of Newfoundland's population resides in these areas.

The industry is characterized by a wide range of plant sizes, using wood input as the basis of comparison (Table 2).

Table 2. Industry structure based on wood input.

Quantity of Wood Used Annually	Number of Plants	% of Total
< 24 m^3 (10,000 fbm)	31	47
24 m^3 (10,000 fbm) to 142 m^3 (60,000 fbm)	22	33
> 142 m^3 (60,000 fbm)	13	20
Total	66	100

The figures indicate that even the largest group of plants are small in comparison with mainland operations. The majority of the plants in Newfoundland (47%) consume less than 24 m^3 of wood input annually. A more detailed analysis of plant characteristics in each group (employment, income, expenditures, etc.) is presented in Chapter 7 of this report.

5.0 WOOD CONSUMPTION

5.1 Introduction

The woodworking industry in Newfoundland and Labrador is comprised of approximately 92 firms manufacturing a wide range of products. The quantity, value and origin of wood input is useful information for provincial government resource and industry development officials.

By understanding the linkages between industry demand for wood input and market supply, the opportunity for replacing imported fibre with domestic supplies may be better explored. Import substitution could expand local logging and sawmilling industries to some degree.

Information on final manufactured products can be used both by industry and government to assist in developing new markets. Expanded markets, both in Newfoundland and abroad, could increase industry output in the woodworking sector.

5.2 Wood Consumption 1981

Nearly 29,000 m^3 of fibre, valued at $6.5 million were used by the woodworking industry in 1981 (Table 3), the majority of which (97%) were lumber products. The industry appears to require a high level of imported wood (77%), reflecting the need for kiln dried lumber and hardwood species not grown locally such as oak or walnut. The lack of significant local panel product manufacturing results in high imports for plywood, particleboard, etc.

Table 3. Volume and value of wood input used by the Newfoundland woodworking industry, 1981.

Wood Input Type	Volume Used		Value ($)	% of Total Volume Imported
	fbm	m^3		
Lumber	11 648 357	27 956	5 571 217	77
Panel Products	329 604	791	896 405	85
Total	11 977 961	28 747	6 467 622	77

In terms of species used, the survey collected data on major species used for lumber. Combining these data with statistics on hardwood versus softwood lumber, one can estimate quantities of lumber used by species (Table 4). These values must be interpreted with caution, however they do provide information on which species are favoured. Figure 2 provides a graphical representation.

Approximately 95% of total wood used is comprised of spruce, pine and fir lumber. Of the hardwoods used, oak and birch are the most common species.

Table 4. Estimates of lumber used by species, 1981.*

Species** type	Volume Used fbm	Volume Used m^3	% of total	Equivalent Cords, @ 500 fbm/cord
a) Softwoods				
Spruce	4 288 294	10 292	37	8 577
Pine	3 498 345	8 396	30	6 997
Fir	3 272 645	7 854	28	6 545
Hemlock	225 700	542	2	451
Sub-Total	11 284 984	27 084	97	22 570
b) Hardwoods				
Oak	196 221	471	2	392
Birch	119 913	288	1	240
Maple	47 239	113	-***	94
Sub-Total	363 373	872	3	726
Grand Total	11 648 357	27 956	100	23 297

* While the sub-total of hardwood and softwood are fairly accurate, the estimates for individual species within each group must be viewed with caution.

** Other species are used, but quantities are small and cannot be estimated.

*** Value less than 1% of total.

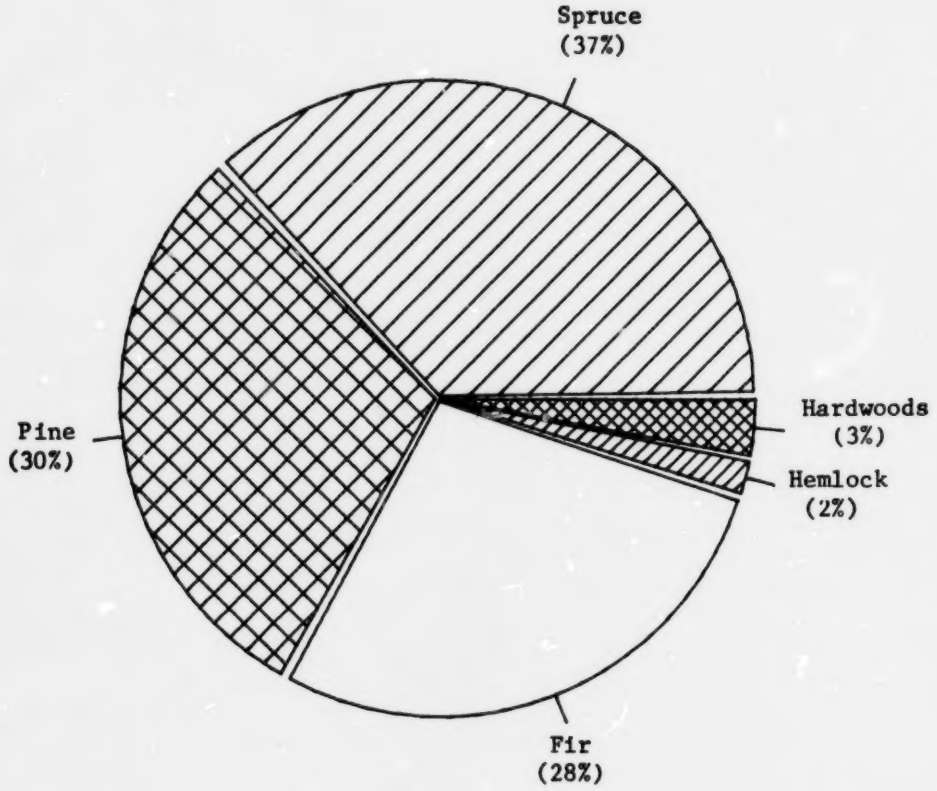

Figure 2. Estimates of lumber used by species, 1981.

The price paid for lumber is very high compared with prices for regular building lumber such as 2" x 4" studs. The higher price reflects the high quality of lumber (kiln dried) required by the wood-working industry for certain products, species used and in some cases, large dimensions. A list of lumber prices was compiled from survey data and a telephone check of several large lumber distributors for a wide range of species (Table 5). For panel products, average prices were $1,113 per m^3 or $33 per sheet (4' x 8').

Table 5. 1981 lumber prices by species (various dimensions).

Species type	Average Price, 1981	
	$/1000 fbm	$/$m^3$
White spruce	460	192
White pine	946	394
Yellow birch	1,500	625
Oak	1,530	638
Poplar	550	229
White birch	1,094	456
Douglas fir	670	279
Black walnut	4,000	1667

6.0 PRODUCTS AND MARKETS

The 1982 survey indicated well over 30 types of wood products were manufactured by the industry. A list of products is found in Table 6. While the survey allowed a listing of product types and total value of sales, the data were insufficient to provide exact quantities of each product manufactured. Many of the smaller firms did not keep adequate records in this regard.

The types of products were wide ranging in both scope and value. As an example, a typical wooden toy will sell for less than $20.00 per unit while a large wooden longliner (up to 20 metres in length) will have a value approaching $500,000.00. The most common type of products were cabinets, windows and doors.

The survey showed that 98% of all products were sold within Newfoundland. The 2% exported outside the Province included wooden toys and a limited quantity of fine furniture. Of the domestic sales, 69% were sold within 50 km of the individual plants. This figure is not surprising given the high concentration of firms located in the St. John's market area. However, this figure also means that firms in rural regions sell a high percentage of their products in the small local community market.

Table 6. List of products manufactured, 1981.

Bar units	Kitchen cabinets	Shelving units
Bath vanities	Lab benches	Shipping crates
Bedroom furniture	Lawn furniture	Stairs
Bookshelves	Living/dining room furniture	Store fixtures
Bunkhouses	Lobster traps	Storm doors
Business countertops	Marine fittings	Table/chairs
Caskets	Modular homes	Telephone poles
Church furniture	Moulding	Windows/doors
Desks	Pallets	Wooden toys
Fishing boats	Preserved wood foundations	Wooden trailers
Food storage closets	Reproduction work	
Industrial cabinets	Roof trusses	

7.0 ECONOMIC IMPACT OF THE WOODWORKING INDUSTRY

7.1 Introduction

Provincial government policy makers often wish to understand the major contributions a specific industry sector provides to the local economy. In many cases, these economic impacts are important at both the provincial and regional level. This information is required to assist in the formulation of government policies which may affect the industry in question. These policies may include taxation, resource allocation, funding assistance and marketing.

No single criterion exists which clearly measures all the economic and social benefits generated by a specific industry. Instead, several criteria must be used, the selection of which depends upon the availability of information. Based on statistics collected from the 1982 questionnaire survey, the following criteria were selected to describe the economic impacts arising from the Newfoundland woodworking industry in 1981;

a) Employment

The number of employees and man years of employment by the industry, consisting of working owners, hired help and unpaid help. Employment has a direct and indirect component.

b) Income

Total wages and salaries paid to hired employees, plus earnings of working owners. Income has a direct and indirect component.

c) Capital and operational expenditures

Capital expenditures refer to monies spent by the industry in 1981 for major plant equipment such as saws, planers and new buildings.

d) Value of shipments

The selling value of finished products at the plant gate.

e) Value added

Value added is calculated as the net[1] value of shipments less costs of manufacturing materials and supplies, fuel and electricity, plus or minus inventory changes. Therefore, value added includes wages and salaries, interest, depreciation, rent and profits. As an alternative definition, value added measures the value "added" to inputs during the manufacturing process.

f) Replacement value of equipment

The replacement value of plant machinery and equipment is used in this study as opposed to depreciated values or book values. The reason for using replacement values is that many of the smaller woodworking operations did not use or understand depreciation methods.

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[1]Net value of shipments is gross sales revenue less hired transportation costs, i.e., value of shipments at mill gate.

7.2 Direct and Indirect Impact

For some economic criteria, both a direct and indirect component can be calculated. The most commonly used criteria are employment and income. Direct employment is the total number of employees in the industry, while direct income refers to wages and salaries paid to these individuals. The expenditure of employee income on goods and services, plus company expenditures on capital and operational items within the province, provide a major economic stimulus. After allowing for income leakages through taxes, savings and expenditures outside the Province, the circulation of remaining income throughout the province may generage additional income and employment in retail service and supply sectors. Therefore, direct impacts may indirectly expand the provincial economy.

Indirect impacts can be estimated by applying multipliers to direct employment and income. This study did not attempt to calculate employment and income multipliers for Newfoundland; this task would be a comprehensive study in itself. Similar multipliers have been estimated for other regions for various sectors of the forest industry. Modifying these multipliers and applying them to Newfoundland is possible but only provides practical estimates of indirect impacts.

Employment and income multipliers from previous studies of the forestry sector are presented in Tables 7 and 8.

Table 7. Employment multipliers.

Location	Industry group	Multiplier	Study source
Ontario	Plywood plants	1.57	Ontario Ministry of Natural Resources, 1981
Ontario	Sawmills/planing mills	1.63	Ibid
Ontario	Miscellaneous plants	1.73	Ibid
Newfoundland	Sawmills/planing mills	1.50	Milne, 198?
Alberta	Miscellaneous plants	2.39	Ondro and Williamson, 1982
Alberta	Small sawmills	2.35	Ibid
Alberta	Fibreboard mill	1.67	Carroll and Milne, 1982

Table 8. Income multipliers.

Location	Industry group	Multiplier	Study source
Alberta	Fibreboard mill	1.49	Carroll and Milne, 1982
Scotland	Pulp and paper	1.44 to 1.54	Greig, 1971
Scotland	All industries	1.24 to 1.54	Brownrigg, 1971

The Newfoundland multipliers are derived by evaluating the structure of the industry, linkages with other sectors of the economy, and the degree of raw materials imported. The regional multipliers are estimated as follows:

a) Employment multiplier - 1.53
b) Income multiplier - 1.40

The low multiplier values reflect the small nature and wide distribution of the Newfoundland woodworking plants, as well as the high propensity to import wood input. For every 1.0 direct employee in the woodworking sector, an additional 0.53 person years of employment are generated in other sectors of the economy. Also, for every $1.00 in direct income within the woodworking industry, an additional $0.40 is generated throughout the economy as the monies are circulated.

7.3 Employment

In 1981, there were approximately 475 full time paid employees, including working owners, in the Newfoundland woodworking industry. Additionally, there were 89 paid part-time, 14 unpaid full-time and 31 unpaid part-time employees.

From survey results, the average number of days worked in 1981 was 237. Therefore, using a working year as 250 days and assuming part-time employees work 50% of available hours, direct person-years of employment in 1981 was 493 paid and 28 unpaid for a total of 521 person-years.

Applying the employment multiplier of 1.53 means that the 521 person-years of direct employment in the woodworking sector help support an additional 276 indirect jobs in other sectors of the economy. Examination of survey data on industry expenditures in 1981, suggests strong linkages between the woodworking sector and the petroleum products, transportation, metal products and service sectors. Therefore, indirect employment impacts are likely strongest in these associated sectors of the economy.

The survey results indicated the following data on employment for the three size classes of woodworking plants (Table 9). This table reveals several trends in employment as plant size expands. First, the days worked per year increases. Second, the use of paid employees increases. Third, the use of unpaid help declines. Fourth, there is little variation in hours worked per shift.

Table 9. Analysis of employment by plant size.

Parameter	Plant Size Class by Fibre Input		
	< 24 m^3	24 to 142 m^3	> 142 m^3
Average number of employees/plant:			
a) Paid; full-time	0.38	4.14	11.27
b) Paid; part-time	0.38	1.55	0.90
c) Unpaid; full-time	0.16	0.23	Nil
d) Unpaid; part-time	0.48	0.27	0.09
Average number of days worked/year	207	249	254
Average length of shift (hours):	8.07	8.20	8.00

7.4 Income

Total income for the woodworking industry in 1981 is shown below:

Total payroll for paid employees	$8,003,529
Total earned income by owners	1,438,388
TOTAL INDUSTRY INCOME	$9,441,917

Applying the income multiplier of 1.40 to the $9,441,917 in direct income, results in an estimated indirect income of $3,776,767. Therefore, total direct plus indirect income is $13,218,684.

Overall, the average income/person-year for the industry is $18,123 (i.e., $9,441,917 ÷ 521 person-years). Survey results also indicated the following detailed income data by plant size (Table 10).

Table 10. Average incomes by plant size, 1981.

Parameter ($)	Plant Size Class by Fibre Input		
	< 24 m^3	24 to 142 m^3	> 142 m^3
Average annual income per paid employee (person-year)	9,094	12,555	17,039
Average hourly income per paid employee	5.44	6.15	8.39
Average annual income per plant owner	13,224	20,079	24,668

Table 10 indicates average incomes increase as plant size expands. How do these incomes compare with the provincial average? In 1981, average yearly income per employee for all manufacturing industries was $16,736 (Nfld. Statistics Agency, 1982). Therefore, incomes of paid employees in small and mid-size woodworking plants are less than the provincial average. For plant owners, incomes are well above the provincial average except for in the smallest plant size class. One should note that the provincial average income figure includes the pulp and paper sector, where incomes are much higher than in most other manufacturing sectors. If one excluded this sector from the provincial average, incomes in the woodworking industry would likely appear more favourable in comparison.

Another statistic related to both employment and income is the number of plant owners engaging in outside employment or who received income from sources other than woodworking. Overall, 37% of plant owners received income from other sources. These owners tend to be concentrated in the small plant size class (Table 11).

Table 11. Percentage of plant owners receiving income from other sources.

Plant size class	% Receiving other income
$< 24\ m^3$	53
$24 - 142\ m^3$	18
$> 142\ m^3$	18

This pattern is not surprising if one considers the trends in employee and owner income. As income from woodworking increases, owners need not rely on outside income to maintain a comfortable standard of living.

7.5 Company Expenditures

a) Capital Equipment

The Newfoundland woodworking industry spent approximately $113,232 on capital equipment in 1981, 38% of which was spent within 50 km of the plants. In terms of individual plants, an average expenditure per business was $1,231. Overall, capital expenditures did not appear to be a major economic benefit in 1981.

The replacement value of plant and equipment in 1981 for the industry was $46,894,971. Overall, 97% of owners indicated their equipment was in good condition and 77% said they would not need new equipment in the near future. Therefore, the potential benefit from new purchases of equipment in the near future does appear to be significant. As current stocks of equipment deteriorate over time and are replaced, the economic benefits derived from capital expenditures could increase.

A summary of capital equipment and expenditures by plant size is shown below (Table 12).

Table 12. Capital equipment and expenditure by plant size, 1981.

Parameter average	Plant Size Class		
	< 24 m^3	24 142 m^3	> 142 m^3
a) Capital expenditure/plant ($)	1 188	604	1 527
b) Amount spent locally/plant ($)	736	247	168
c) Percentage spent locally (%)	62	41	31
d) Replacement value, plant and equipment per plant ($)	94 119	157 143	1 335 682
e) Percentage of plants needing new equipment (%)	30	18	15
f) Percentage of plants with equipment in good condition (%)	97	95	85

While no trends are evident regarding the amount of capital expenditure, the percentage and value spent locally declines as plant size increases. This trend is explained by the fact that as mill size and complexity increases, the ability of local business to supply capital equipment declines.

b) Operational Expenditures

The total operational expenditures, percentage spent locally (within 50 km of the plant), and value of local expenditures are presented in Table 13. Figure 3 provides a graphical summary.

Table 13. Operational expenditures by the woodworking industry, 1981.

Expenditure item	Total expenditure ($)	% of total expenditure	% spent locally	Local expenditure ($)
a) Fuel and Power				
Fuel, lubricants	1,507,797	20	31	462,272
Electricity	311,754	4	Nil	Nil
b) Materials and Supplies (excluding wood)				
Metal products	1,006,974	13	37	367,901
Finishing materials	410,068	5	39	160,483
Office supplies	54,817	1	66	35,906
Other non-wood materials	2,277,488	30	6	140,450
c) Services				
Hired transportation	409,115	5	96	392,473
Insurance	278,786	4	44	121,973
Equipment rental	60,317	1	76	45,698
Interest	660,062	9	100	660,062
Maintenance/repair	388,578	5	91	353,294
Other	208,943	3	68	141,840
TOTAL	7,574,699	100	38	2,882,352

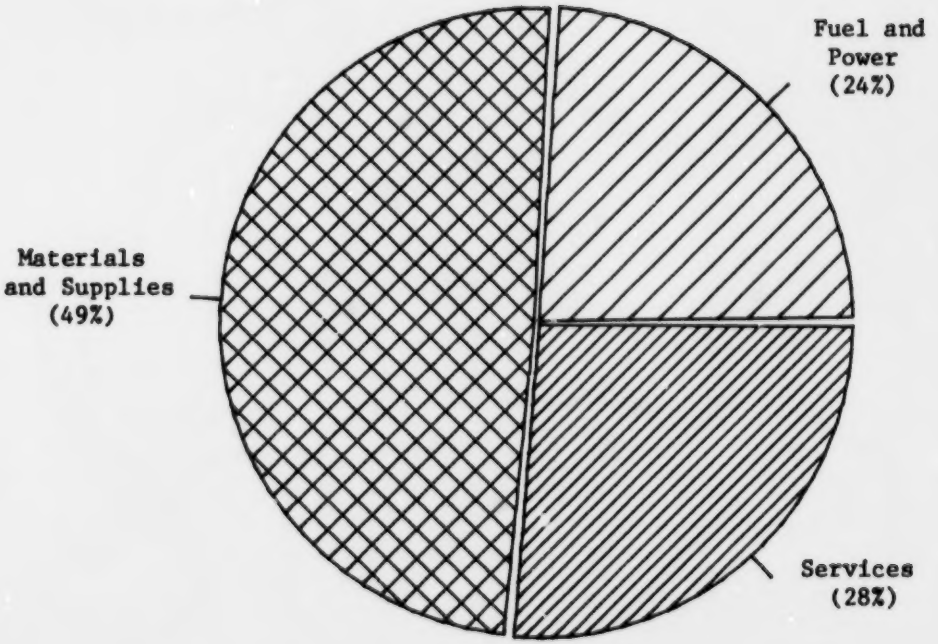

Figure 3. Operational expenditures, 1981.

Nearly $7.6 million was spent by the industry in 1981 on operational items, with $2.9 million, or 38% flowing to local businesses within 50 km of the woodworking plants. The majority of operational expenditures are directed to the major urban supply centres of St. John's, Grand Falls and Corner Brook. More specifically, both fuel and power, and materials and supplies, have low percentages for local expenditures, while a higher percentage is evident for service expenditures. Therefore, commodities tend to be imported into a local region, while local services are more highly utilized.

The reader should note that a portion of local expenditures, especially for commodities, will eventually leak out of the region. However, the initial expenditure provides the major stimulus to the local economy. The longer these monies are circulated within the region, the greater the indirect impact will be.

In comparing the three plant size classes, the following expenditure trends were calculated from survey results (Table 14).

For all plant classes, the majority of operational expenditures are for materials and supplies (excluding wood). Also, as plant size increases, the percentage of local expenditures declines. As was the case with capital expenditures, local businesses are less able to supply goods and services when plant capacity increases.

Table 14. Operational expenditure patterns by plant size.

Plant size class	% of Total Expenditure by Item			% of total expenditure within 50 km of plant
	Fuel and power	Materials and supplies	Services	
< 24 m^3	30	46	24	69
24 to 142 m^3	16	67	17	43
> 142 m^3	25	47	28	36
Overall	24	49	27	38

7.6 Value of Shipments

The value of shipments in 1981 was $33,767,784. Given the low level of exports (2% of sales), very little income is received from outside the province for product sales. Therefore, the industry does not contribute to the provincial export base. Within the province, however, individual communities benefit from exports to other regions. The survey indicated that 29% of sales were made in markets greater than 50 km from the individual plants. At a community level, these "export sales" may be important where a large woodworking plant is located.

7.7 Value Added

Total value added for the woodworking industry in 1981 was an estimated $20,753,571. This figure is calculated by subtracting from gross sales revenue, costs of transportation fuel and power, materials and supplies, wood inputs, maintenance and repair. The resulting value added figure includes depreciation, incomes, taxes, company paid employee benefits, insurance, leasing or rental costs, other miscellaneous costs and a residual for profit. Calculations are presented in Appendix B and follow the approach used by Teskey and Smyth (1975) in a report on the Alberta forest industry. Table 15 presents value added data by plant size class.

Table 15. Value added by plant size.

Value added Parameter	Plant Size Class			Overall
	< 24 m^3	24 - 142 m^3	> 142 m^3	
Value added/person year	33 260	24 251	44 685	39 834
Value added/$ gross revenue	0.79	0.67	0.59	0.62

Generally, one might expect value added per person year to increase as plant size expands. Reasons include higher wages and employee benefits, and lower employment per unit of output as larger plants substitute capital for labour. While value added per person year

increases from the < 24 m^3 class to the > 142 m^3 class, a decline occurs in the mid-size class. One explanation may be that plants in this class are operating with a low capital/labour ratio. In other words, the potential may exist to substitute more equipment for labour. Table 9 indicates that the mid-size plants employ a high number of paid part-time staff compared to the other two plant size classes.

7.8 Other Economic Impacts

Within Newfoundland, the woodworking industry and employees create additional impacts. These include corporate income tax, retail sales tax and provincial fuel tax paid by the individual businesses each year. Also, plant employees and owners will contribute to provincial revenues through payment of personal income tax, retail sales tax and fuel tax. Data on public revenues were not collected during the survey in 1981. The question of taxes paid was judged too sensitive to include in the questionnaire and was therefore omitted.

In the absence of concrete data, one can only estimate public revenues generated by the woodworking industry. Applying methods and assumptions used in a previous study of public revenues generated by the Newfoundland forest industry (Milne, 1981), the following estimates are derived:

Provincial taxes paid by companies:	$0.98 million to $1.26 million
Provincial taxes paid by employees:	$1.58 million to $1.63 million
TOTAL	$2.56 million to $2.89 million

The reader should be reminded that the previous figures are estimates only and are sensitive to the various assumptions applied. Also, one should remember that taxes are collected for general revenue purposes and are intended for distribution to the population as a whole. Therefore, one cannot equate the amount of taxes the woodworking industry pays with the level of direct government services received (Milne, 1981).

The public revenues received from firms and employees in the woodworking industry are of benefit to Newfoundland, however these accounted for less than half of 1% of total provincial tax revenues in 1981. Therefore, these revenues do not constitute a major impact to the provincial economy.

From a local "community" viewpoint, the individual woodworking plants are important contributors to regional economies. Municipal taxes, local expenditures and employment certainly contribute to community income and economic stability in rural areas. Forty-nine, or approximately 53%, of the 92 woodworking establishments identified in 1982 were located in rural areas. While few if any firms are large enough to sustain a community's economy on its own, the individual firms do make a positive contribution to a local community economy.

7.9 Summary of Economic Impacts

Table 16 summarizes the major economic impacts created by the Newfoundland woodworking industry in 1981.

Table 16. Summary of economic impacts, 1981.

	Economic variable	Impact
a)	Direct employment	521 person years
b)	Indirect employment	276 person years
c)	Direct income	$9,441,917
d)	Indirect income	$3,776,767
e)	Capital expenditures	$113,232
f)	Operational expenditures	$7,574,699
g)	Replacement value of plant/equipment	$46,894,971
h)	Value added	$20,753,571
i)	Value of shipments	$33,767,784
j)	Public revenues generated	$2.56 million to $2.89 million

8.0 TIME SERIES ANALYSIS AND INTER-INDUSTRY COMPARISONS

8.1 Time Series Analysis

The NeFRC survey provided detailed cross-sectional data on the Newfoundland woodworking industry for 1981. It is also useful to have time series data available for an analysis of trends over a given period of time. The only published data available are from Statistics Canada (Catalogue 25-202). As discussed in chapter 1, these data only include approximately 15 of the larger firms in Newfoundland and thus do not

reflect the true scale of the industry. While recognizing these limitations, the data can be used in a time series analysis to evaluate trends in costs, revenues and incomes. Table 17 presents a summary of average annual percentage changes in several economic indicators over a ten year period, 1971 to 1980. Real, or deflated values were calculated using appropriate price indices supplied by the Newfoundland Statistics Agency.

Table 17. Time series analysis, Newfoundland woodworking industry, 1971-1980.[1]

Economic indicator	Average Annual Percentage Change 1971-1980	
	Nominal[2]	Real[3]
1) Cost of fuel and electricity per plant	18.3	9.3
2) Cost of materials and supplies per plant	18.2	12.0
3) Value of shipments per plant	16.4	5.9
4) Total wages and salaries per plant	16.1	6.9
5) Total value added per plant	16.4	9.4
6) Average income per employee	13.0	4.1

[1]Source: Statistics Canada, Catalogue 25-202, annual.

[2]Calculated from current values which include inflation.

[3]Calculated from deflated values which exclude inflation.

All economic indicators increased annually, both in nominal and real terms over the ten-year period. Examining deflated, or real percentage increases, one can see that most of the nominal increases were due to inflation. Another trend is that while real incomes, value added and value of shipments exhibited positive annual increases, operating costs also increased but at a higher rate. Therefore, in real terms, incomes and revenues did not keep pace with costs from 1971 to 1980.

8.2 Inter-industry Comparisons

Using survey results, one can compare the scale of the woodworking industry with other forest industry sectors in the Province. Comparisons can also be made with other manufacturing sectors aside from forestry.

Table 18 presents selected variables to compare the different forestry sectors in Newfoundland for 1981. Data for sawmills and planing mills, and the woodworking industry are derived from NeFRC survey statistics which are more complete than Statistics Canada information. Data for logging and pulp and paper are derived from Statistics Canada information which is felt to accurately represent these two sectors.

In terms of total values, the woodworking sector generally ranks third behind pulp and paper and logging. The pulp and paper sector is by far the major forest industry in the Province. The woodworking sector ranks second behind the pulp and paper industry based on value added per person-year, and third, using average income per person-year. Employment per $1000 of product is second lowest while value added per $1.00 of product and is the highest. These trends suggest the woodworking industry is capital intensive, with low labour requirements and high incomes per employee.

How does the woodworking sector compare to other, non-forestry manufacturing sectors? In absolute terms (Table 19), the woodworking industry is small compared with fish products, food and beverage and total manufacturing. Of interest is the fact that value added in the woodworking industry is higher than in the slightly larger chemical industry.

In terms of value added per employee and income per employee (Table 20), the woodworking industry ranks first and second respectively when compared to the three other selected industries. The woodworking industry also ranks above the provincial average for the two previous criteria. Value added per $1.00 shipments is higher than all other manufacturing sectors while employees per $1000 shipments is among the lowest.

These comparisons indicate that employees in the woodworking industry receive relatively high benefits compared to most other forestry and manufacturing sectors. The number of employees per $1000 output is among the lowest although equal to the Provincial average. This low ranking partially explains the high value added and income per employee.

Table 18. Newfoundland woodworking industry compared to other forestry sectors, 1981.

Economic variable	Forestry Sector			
	Wood-working industry[1]	Logging industry[2]	Sawmills and planing mills[3]	Pulp and paper industry[2]
A) Total Values				
1) Employment (person-years)	521	1,580	1,356	2,981
2) Total income ('000 $)	9,442	33,254	5,237	90,208
3) Total value added ('000 $)	20,754	52,324	3,518	194,049
4) Value of shipments ('000 $)	33,768	89,422	8,809	353,000
B) Average Values				
5) Person-years/$1000 shipments (PY's)	.015	.018	.154	.008
6) Value added/$1.00 shipments ($)	.615	.585	.399	.550
7) Value added/ person-year ($)	39,835	33,116	2,594	65,095
8) Income/Person-year ($)	18,123	21,047	3,862	30,261

[1]Source: NeFRC survey: data for 1981.

[2]Source: Statistics Canada, Catalogue 25-202: data for 1981.

[3]Source: Milne, 1984: data are estimates from 1981 survey and include all mill classes.

Table 19. Comparison of Newfoundland woodworking industry to other non-forestry manufacturing sectors, 1981:absolute values.

Economic Indicator	Manufacturing Sector[1]				
	Woodworking industry	Fish products	Chemical industry	Food and beverage	All manufacturing industries
1) Employment (person-years)	521	9,415	709	11,509	18,210
2) Wages & Salaries ('000$)	9,442	151,130	15,695	169,562	310,535
3) Value of Shipments ('000$)	20,754	376,600	70,900	575,450	1,138,125
4) Value added ('000$)	33,768	174,676	27,026	255,741	576,856

[1]Data for sectors other than woodworking are derived from Statistics Canada sources for 1980 estimated to 1981.

Table 20. Newfoundland woodworking industry compared to other non-forestry manufacturing sectors, 1981:average values.

Economic variable	Manufacturing Sector[1]				
	Woodworking industry	Fish products	Chemical industry	Food and beverage	All manufacturing industries
1) Employees/$1000 shipments (P-Y)	.015	.025	.010	.020	.016
2) Value added/$1.00 shipments ($)	.615	.467	.382	.453	.510
3) Value added/employee ($)	39,835	18,553	38,119	22,221	31,678
4) Income/employee ($)	18,123	16,052	22,137	14,733	17,053

[1]Data for sectors other than woodworking are derived from Statistics Canada sources for 1980; estimated to 1981.

9.0 ADDITIONAL STATISTICS

The 1982 survey collected a wide range of data on the Newfoundland woodworking industry. Most data have been presented in preceeding chapters. This chapter summarizes remaining data collected during the survey, therefore addressing a major study objective which was to present information on the industry. Data are summarized in Tables 21 to 24.

Table 21. Type of plant ownership by percentage.

Ownership type	% Owners by Plant Size Class			Industry overall
	< 24 m^3	24 to 142 m^3	> 142 m^3	
Single owner	71	46	8	50
Partnership	19	4	8	8
Corporation	10	50	84	42

Table 22. Sources of financing.

Financing source	% of Funding by Plant Size Class			Industry overall
	< 24 m^3	24 to 142 m^3	> 142 m^3	
Federal gov't	0	5	0	3
Provincial gov't	33	22	0	33
Banks/trust co's	40	27	15	28
Personal savings	27	41	31	23
Friends, relatives	0	5	0	2
Internal Financing	0	0	54	11

Table 23. Production plans for 1983.

Production plans for 1983	% Plans by Plant Size Class			Industry overall
	< 24 m^3	24 to 142 m^3	> 142 m^3	
Expand production	41	9	8	23
Same level	55	82	69	67
Decrease production	4	0	23	6
Shut-down	0	9	0	4

Table 24. Willingness to join a wood products association.

Willing to join?	% by Plant Size Class			Industry overall
	< 24 m^3	24 to 142 m^3	> 142 m^3	
Yes	59	64	54	59
No	41	36	46	41

10.0 PROBLEMS AND OPPORTUNITIES

10.1 Background

Through the questionnaire data and from talking with plant owners, several problems affecting the growth and development of the industry are evident. This chapter identifies problems and presents possible solutions.

10.2 Local Wood Quality

Market prices paid for imported lumber and panel products are high. These prices reflect the fact that very little domestic fibre can supply the woodworking industry's demands in terms of moisture content, species and wood type. For example, most panel products are imported

since only limited domestic production occurs. Also, most hardwood species such as walnut or oak do not grow naturally in Newfoundland and must be imported. Finally, large dimension softwood lumber sizes, or species such as white pine and Douglas fir must be imported, again due to local supply constraints.

The potential for import substitution does exist for smaller dimension softwood lumber and birch hardwood lumber. These products can be supplied locally, however, lumber quality must be improved. The quality of local softwood lumber was a common complaint among woodworkers during survey interviews. Problems included inconsistent widths, and high moisture content. For local birch lumber, the lack of kiln drying was a problem limiting its use by woodworkers.

There are several steps which might reduce these problems. First, kiln drying technologies must be developed which can be adopted by individual sawmills, or lumber distributors. The kiln must be inexpensive and use locally available equipment. The Provincial Department of Development recently spearheaded efforts to build a small, portable kiln for display throughout Newfoundland. These demonstrations have been successful in that several businesses are interested in constructing kilns based on this prototype. The adoption of this system will remove a major constraint against using local lumber, especially birch. Improvements in lumber quality may also be facilitated by wider use of grading standards and new technology in the sawmill industry.

At first glance, the potential for birch import substitution appears small; for example only an estimated 288 m^3 (240 cords) of birch were used by the industry in 1981. The potential for increasing the use of domestic birch lies with substitution for other imported species such as pine (softwood) and maple (hardwood). There also appears to be a large scope for substituting local softwood lumber such as spruce for imported supplies, however as with birch, lumber quality must be improved.

10.3 Technology Transfer

The survey revealed the industry to be comprised of many small and geographically dispersed plants. In addition, there is an absence of a province-wide industry association. These factors contribute to problems with technology transfer from other regions of Canada and the United States. For example, information on new equipment, sawing, gluing and finishing is lacking in Newfoundland at the industry level. There also appears to be a need for stronger efforts by the provincial and federal governments in Newfoundland towards addressing these concerns.

The distribution of woodworking and wood technology information from outside Newfoundland would be an important government service. The industry could facilitate this process through the development of a Province-wide association. Co-operative efforts such as an industry trade show would be of great assistance towards improving technology transfer. In addition to information transfer, funding programs must be available to assist the industry in adopting new technology.

10.4 Marketing

The fact that 69% of total production is sold within 50 km of individual plants suggests that improved marketing might increase sales outside the local community area. The potential for displacing mainland imports of final goods such as furniture, molding and cabinets could be increased with improved marketing, providing that local products are price-competitive. An industry association would be a logical first step in developing a clearly defined marketing strategy. Consumer access to information on locally manufactured products, prices and plant locations must be improved.

10.5 Management/Accounting

While some firms illustrated efficient bookkeeping methods, many of the smaller firms had weak management and accounting skills. Some owners, for example, did not understand principles of equipment depreciation. In other cases, owners had accurate figures on total costs and revenues but were unable to list the exact number of specific products manufactured. Therefore, information on per unit costs and revenues is not available to assist these owners in making management decisions with pricing, discounting, improving profitability, etc. During the survey, very few owners appeared to be concerned with this problem. At each interview, Federal Business Development Branch material designed to assist small businesses, was made available, however, very few owners took the information. An industry association may perhaps be a better vehicle to distribute this information.

11.0 SUMMARY

This report presents data collected in 1982 from a questionnaire survey of the Newfoundland woodworking industry. The data are for the 1981 calendar year. Ninety-two woodworking plants were identified as operating during 1981, of which 66 participated in the survey.

To improve the analysis of the industry, firms were grouped into three size classes based on the quantity of wood inputs used in 1981. This study presents statistics based on group averages and total estimates for the 92 plants operating during 1981.

Results indicate the industry used a total of 28 747 m^3 (11,977,961 fbm) of fibre in 1981, with a total value of over $6.5 million. Approximately 77 percent of this fibre was imported from outside Newfoundland. There appears to be some potential for increasing the use of local small dimension softwood and birch hardwood lumber, however current problems with quality must be addressed. These problems centre on inconsistent lumber sizes and absence of kiln drying. Possible solutions include strengthening grading practices and improving sawmill technology. Also, the recent introduction of low cost kiln drying technology to the woodworking industry should be of benefit. Additional problems identified were a lack of information on wood technology, and weak management/accounting skills. The formation of a Province-wide industry association would likely assist in reducing these problems.

The industry manufactured a wide range of products in 1981 worth $33.8 million, of which 98 percent were sold within the Province. Newfoundland's geographical position limits exports of wood products to the mainland, however the marketing of products within the Province could be improved. Nearly 70 percent of total output in 1981 was sold within 50 km of the individual woodworking plants. Therefore, the industry appears to serve mainly the local community area. By improving marketing of wood industry products, potential exists to increase import substitution for selected goods in the larger urban centres on the Island. These goods include furniture, cabinets and molding.

The survey revealed the woodworking industry makes a sizeable contribution to the economy at both local and provincial levels. Total direct employment, including paid and unpaid workers, was 521 person-years in 1981. Direct incomes, including wages and salaries, plus earned income by owners, was $9.4 million.

Total operational expenditures excluding wood, were $7.6 million while capital expenditures were over $113,000. Applying appropriate multipliers indicates an estimated 276 person-years of indirect employment and $3.8 million in indirect incomes are created in other sectors of the provincial economy through a "spin-off" effect. These indirect benefits result from direct employment, incomes and expenditures in the woodworking industry. Total value added in 1981 was $20.7 million while estimated public revenues generated by the industry were over $2.5 million.

Average income and value added per employee rank high compared to other sectors of the Provincial economy. At the community level, individual woodworking businesses are an important component of the local economy in terms of providing employment and income. The continued development of this industry would be of benefit to both the community and Provincial economy.

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Appendix A

Definition of Woodworking Industry

The forest industry is defined by the Canadian Standard Industrial Classification (Statistics Canada: Catalogue 12-501E). This classification system separates the forest industry into the following sectors:

FORESTRY

031 Logging
039 Forestry Services

WOOD INDUSTRIES

251 Sawmills, Planing Mills and Shingle Mills
252 Veneer and Plywood Mills
254 Sash, Door and Other Millwork Plants
256 Wooden Box Factories
258 Coffin and Casket Industry
259 Miscellaneous Wood Industries

PAPER AND ALLIED INDUSTRIES

271 Pulp and Paper Mills
272 Asphalt Roofing Manufacturers
273 Paper Box and Bag Manufacturers
274 Miscellaneous Paper Converters

For this report, the woodworking industry refers to SIC groups 252, 254, 256, 258 and 259.

Appendix B

Calculation of Value Added

	Gross sales revenue	($33,767,784)
Less:	Hired transportation costs	($409,115)
=	Net sales revenue	($33,358,669)

Net sales revenue less	Fuel and electricity	$1,819,551
	Materials and supplies	$3,749,347
	Wood inputs	$6,647,622
	Maintenance and repair	$388,578
	= Value Added by Manufacturing	$20,753,571

Appendix C

List of Conversion Factors

1 mile	=	1.609 kilometres (km)
1 cord (85 cubic feet solid wood)	=	2.407 cubic metres (m^3)
1000 board feet (fbm) lumber	=	2.362 m^3 lumber
1 sheet 4' x 8' panel (3/8" basis)	=	0.288 m^3
1 sheet 4' x 8' panel (3/8" basis)	=	12.0 fbm
1 cord (85 cubic feet solid wood)	=	500 fbm sawn lumber

Source: Metric Handbook for Canadian Softwood Lumber, 1977.